CASES OF URETHRAL STRICTURE AND THEIR MANAGEMENT.

BY

JAMES PEDERSEN, M.D.,

NEW YORK.

Adjunct Professor of Venereal and Genito-urinary Surgery, New York Post-Graduate Medical School and Hospital; Fellow New York Academy of Medicine, etc.

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THE following reports, compiled from my office and hospital notes, exemplify some of the phases and complications of urethral stricture, and describe the management that seemed appropriate to each individual case. The term "management" has been used advisedly, implying that the "treatment of stricture," in its literal acceptation, forms but a part of what is necessary to secure to the patient the best ultimate result.

CASE I will illustrate the management of a stricture of small caliber complicated by an acute specific urethritis. Incidentally it presents a typical if not the normal course of such a urethritis in a healthy, intelligent man.

W., age thirty-nine, married, presented at the office with a urethral discharge, a sense of irritation in the deep urethra, and slight frequency and urgency of urination. At night he was obliged to urinate twice. He had had two previous attacks of urethritis; respectively nineteen and fourteen years before. The second left a stricture which was dilated to 28 F. by his surgeon. The patient was then taught to pass a sound; but he neglected to do so until retention threatened. He then resumed

*Read before the Genitourinary Section of the New York Academy of Medicine.

gradual dilatation on his own account, beginning with No. 16 F. He carried it up to 20 F., after which he passed a sound only at intervals. At the time he contracted the urethritis for which he now sought relief, he had not passed his sound in two months.

Examination revealed all the evidences of a virulent infection with severe inflammation. The prostate was normal, except for tenderness in the median line. At this time no gonococci were found. A urinary antiseptic was prescribed and he was directed to drink water freely between meals, to remain recumbent, to wear a suspensory, to take three hot sitz-baths daily, and twice daily to flush the urethra with a warm 1-30,000 solution of bichloride of mercury, using a quarter-ounce hand-syringe. His use of alcoholics, tobacco, and coffee was regulated.

The anterior urethritis began to subside at once; but the acute posterior urethritis ran the usual course of a mild inflammation in this region. By the tenth day the patient was almost free from the sense of irritation, and the urinary intervals were nearly normal. No attempt was made to arrest or to modify the acute posterior urethritis because of the patient's hypersensitiveness and fear of instrumentation, and because the inflammation was of that mild grade which requires no intervention. Many gonococci were now found. By the fourteenth day the discharge had begun to diminish. The prostate remained uninvolved.

On the twentieth day the subacute stage having set in, the urotropin was replaced by a balsam. Sitz-baths were continued for a few days longer to minimize any congestion about the stricture. To the same end the warm hand-injection was only gradually withdrawn and replaced by an astringent. At the close of the fifth week there remained only a glairy morning drop and the urinary intervals were

normal. The urine was clear, but contained many shreds. All liability to retention having passed, the patient was sent away for two weeks with instructions to use his hand-injection of bichloride, if necessary. The necessity arose but once—after exposure to cold and wet followed by whiskey. A mucoid discharge reappeared, but promptly disappeared under the injection. The urine, however, had again become clouded.

As the urethra evidently was still susceptible, dilatation was postponed another fortnight. It was then begun with his own 18 F. sound, which he succeeded in passing after a little manipulation under supervision. There are no skill and gentleness equal to those of the patient himself once he has practised the technique and learned the peculiarities of his urethra. In this particular case I believe it was good management, not only to let the patient make the initial attempt (under supervision), but also to allow him the instrument he was accustomed to, in spite of its caliber, which was dangerously small for use in a recently inflamed, strictured urethra. The instrumentation was followed by copious irrigation of the penile urethra from the meatus.

The only reaction was a trifling increase in the discharge, which his hand-injection promptly arrested. At the end of a week the dilatation was carried to 20 F. Six days later, sounds 20 F and 22 F. were passed with the utmost care and gentleness. Nevertheless, a little blood appeared at the meatus. The usual after-irrigation was therefore employed. He was now free from all urethral irritation and the urine had become almost clear.

The stricture's caliber having been restored to 20 F., with which the patient had always been satisfied, he now considered himself cured and stopped treatment, contrary to advice.

To explain certain details in the management of

this case it should be stated that the patient was first directed to flush or "irrigate" his urethra with a solution as hot as he could comfortably bear because of the highly inflamed condition, and that the flushing was continued long after the primary indication had ceased because of the susceptibility of his urethra. Furthermore, he was fastidious, apprehensive, and possessed of preconceived notions. Of astringents in general, and silver nitrate in particular, he had an unconquerable dread that was not without some foundation in fact, judging from his decription of the treatment given him in the first instance, fourteen years before.

Case II will illustrate one possible management of an irritable and somewhat resilient stricture, which, theoretically, often requires urethrotomy.

P., age thirty-five, married. In May, 1900, he entered Bellevue Hospital with retention of urine due to a contracted organic stricture in the upper bulbous region. This was relieved with filiform guide and tunnelled catheter, after which, gradual dilatation, accompanied by irrigation of the penile urethra from the meatus, was begun. The first three dilatations were followed by a urethral chill; on one occasion spasmodic retention occurred. At the end of two weeks, the stricture having become sufficiently dilated to render a recurrence of retention unlikely, he was allowed to leave the hospital and to come to the office for treatment. In preparation he was given quinine, three grains three times daily for two days. The technique of the dilatation was as follows: Copious irrigation of the penile urethra from the meatus with a solution of 1 to 30,000 bichloride of mercury; then distention of the penile urethra with iodofom oil; then the instrumentation; finally, irrigation of the penile urethra again. First, Banks' dilating filiform bou-

gies were used; then flexible bougies until 16 F. could be passed with ease; then sounds. Thus, at four-day intervals, the caliber was gradually increased until, on the occasion of the fourth dilatation at the office, sound 20 F. could be passed to the bladder. No urethral chill followed these dilatations at the office, nor hemorrhage, excepting the second when a drop of blood appeared at the meatus. At the fourth dilatation the quinine was discontinued on trial; but feeling himself threatened with a chill three days later, he resumed it according to orders. It was continued for a few weeks after this.

Irrigations before and after were now discontinued; but sterile iodoform oil remained the lubricant. At the seventh dilatation, one month after he left the hospital, a 24 F. bougie was passed. As it was followed by a slight stain of blood, an instillation of silver was given in the form of a 1-per-cent. solution of protargol—it being less irritating than the nitrate. The patient now went abroad for the summer.

He returned three months later, having been well and free from urethral symptoms. Exploration showed a recontraction to 16 F. Quinine was prescribed and dilatation was resumed by the same technique as originally. In spite of all, he had a chill after the second dilatation of this course. Furthermore, the stricture increased in irritability, as shown by the tendency to urethral spasm at the time of instrumentation. This irritability was met by the topical use of protargol first, then silver nitrate, combined with dilatation at intervals of one week, the urine being kept bland meanwhile. His final chill occurred at this time, during an unusual congestion of the urethra. As before, the seventh dilatation carried the caliber up to 24 F.

The same general management was followed until

27 F. was reached. He was then taught to pass the sound. For a period he did so once a week, reporting at progressively longer intervals for inspection and treatment. While the size of the sound was gradually increased the frequency of its use was decreased until, a month before the end of the second year, he was passing 29 F. every third week without reaction, and without other precaution than ordinary asepsis.

This rate was continued for six and one-half months, when the sound was tentatively discontinued, one year ago. Neither recontraction nor irritability has developed, as proven by repeated examinations at intervals. The latest was made six days ago. From the day he left the hospital he attended to his business without interruption.

The next two cases are reported somewhat in detail because of the important and interesting complications they present.

Case III is one of tight stricture, chronic cystitis and recurring epididymitis.

G., age thirty-one, married, presented with the history of tight stricture of long standing, and added that whenever dilatation had been undertaken, an incapacitating epididymitis had either threatened or occurred. The left epididymitis had been inflamed once; the right, three times. As a consequence he had never persevered in any course of treatment. Once epididymitis had developed independently of any instrumentation. Though liable to retention, he was most reluctant to have any treatment begun. The symptoms were a small stream; a sense of "tightness" in the urethra when urinating; a straining to urinate; a milky morning drop; bloody semen, and a continuous lumbar ache. No nocturnal urination. The diurnal intervals were from four to five hours; occasionally, he had periods of diurnal frequency, unaccountable except

by supposing an irrigating urine; a transient exacerbation of the urethrocystitis, or the presence of a calculus. He had had urethritis once, fourteen years before. There was no history of traumatism.

The two-glass test showed equally cloudy, faintly ammoniacal urine and many shreds. This bad quality, the history of recurring epididymitis, and the importance of reassuring the patient, made it good management to confine the first instrumentation to a cursory examination of the penile urethra, and to occupy a few days in improving the urine and preparing the urethra for the detailed exploration and subsequent treatment. A tight stricture in the bulbous portion and general hyperæsthesai of the urethral mucous membrane were found. The patient was instructed how to use a hand-injection of a warm solution of bichloride of mercury (1–30,000) twice daily, and a urinary antiseptic every three hours was ordered. He was warned against the usual causes of retention. Fortunately his habits as to alcohol, tobacco, and coffee were exceptionally good.

After five days of this preparation the penile urethra was irrigated copiously and distended with iodoform oil, a filiform bougie introduced, and over it a 12 F. tunnelled catheter was passed to the bladder. Two ounces of turbid residual urine were evacuated, and two and one-half ounces of a warm solution of silver nitrate (1–3,000) were gently instilled into the bladder and left. Tunnelled sounds 14 and 16 F., in turn, were next threaded on the filiform and passed to the bladder. This completed the first dilatation. Irrigation of the penile urethra was repeated, massage of the prostate performed, and the patient allowed to void the silver nitrate solution that had been left in the bladder. The hand-injection and the cystogen were continued; in addition he was directed to take

a hot sitz-bath three times daily and to keep off his feet as much as possible. He remained recumbent more or less for three days, then left the city on business, and ten days elapsed before he could present himself again, at which time he was able to report that his backache had disappeared, that urination required less effort and was comparatively comfortable, and that he had had no symptom of the dreaded epididymitis.

A true recontraction, however, had taken place. Accordingly the previous dilatation up to 16 F. was repeated. Four days later it was possible to introduce a 12 F. natural curve web catheter for the purpose of preparing the bladder *before* proceeding with the dilatation, and tunnelled sound 14 F. entered so easily that it was permissible to follow it by No. 18 without the intermediate sizes.

Dilatation now proceeded at intervals of from five days to two weeks, depending upon his imperative business engagements out of the city. On two or three occasions it was omitted, and only irrigation of the bladder and massage of the prostate were performed because of a suspicious ache in one or the other groin. At the end of five months, when preceded by sound, 23 F., 24 F. could be passed to the bladder easily and with very slight discomfort to the patient; the residual urine had diminished to only half an ounce; its turbidity was slight; its odor normal. No hemorrhage had been excited. Epididymitis had not occurred.

The strictures (subsequently a second one was found at the bulbomembranous junction) are fairly rigid and unyielding. This fact, together with the unavoidable irregularity of the visits at long intervals, accounts in part for the relatively slow progress. Under eucaine anæsthesia the dilatation probably could have been carried a point

higher at each sitting. This was not practised, it being preferable in such a case as th s to have the patient's sensations assist in deciding the permissible degree of dilatation. So long as he had a stricture offering any appreciable obstruction to the urinary stream, and a posterior urethritis of sufficient grade to cloud the urine, just so long would he be liable to recurring epididymitis, one exciting cause of which would be an overdilatation. The prime objcct was to remove the risk without precipitating the accident.

I regret that in this I was not successful. Four months later, when the caliber had reached 26 F., his first epididymitis developed during a period of turbid urine, the result of crrors in diet to which he was prone, and immediately after repeated violent exercise, followed by a jarring of the testicle. Thcre had been no instrumentation for eight days. After steady progrcss for another four months, during which his urine was brought to an almost normal quality, though his visits had becn somewhat irregular, a second epididymitis dcveloped under similar conditions, fourteen days after instrumentation. A month later he broke down from overwork, too frequcnt coitus and violent exercisc. This was promptly followed by a relapse of his old-time intermittent fever with hæmaturia. It yielded to quinine as bcfore. Thcrc was frequency for a few days.

He was then sent on a vacation. On his return tentative dilatation was resumed. It resulted directly in his third epididymitis. After a second period of rest his health bcgan to improve, and aided by free diuresis his urine returned to normal.

The Oberländer dilator was now substituted for the sound with apparent benefit, but following the use of a 1–1000 silver nitrate solution in the bladder the fourth epididymitis developed dircctly. Dila-

tation was thereupon discontinued and argyrol solution, 5 per cent.,was substitued for the silver nitrate in the effort to further improve the bladder and posterior urethra before resuming dilatation again. He is under this treatment at present.

Owing to the patient's size and to the rigidity of his perineum, the massaging finger with difficulty reaches the limits of the prostate. Nevertheless massage of the prostate has been repeated after every dilatation, not only to reduce the congestion of the prostate body, but also to express into the prostatic urethra any inflammatory products that may have been pressed into the ejaculatory ducts by the instrumentation, and to have the same swept thence by the silver solution left in the bladder and voided for that purpose at the completion of each dilatation.

Case IV, one of traumatic rupture of the urethra, details the management of a post-operative filiform stricture with a perineal urinary fistula.

H., age forty-nine, single. In jumping from a moderate height he struck on a post and sustained a complete rupture of the urethra. Apparently the gravity of the condition was not recognized; when seen by a consultant forty-eight hours after the accident the extravasation of urine had become extreme. As described to me by the patient, three operations followed: The first, performed forty-eight hours after the accident, liberated the extravasated urine and established bladder drainage; the second, performed two weeks later, reunited the severed urethra; the third, six months later, was to close a urethral fistula that remained. As is not uncommon, this failed of complete success. Through some misunderstanding the after-treatment was discontinued, and the patient was left with a sinus leading from the deep urethra and bulb to a point in the perineoscrotal region, and

with a dense, tortuous stricture at the corresponding point in the urethra. Through the sinus urine leaked continuously, and with every urination a quantity would escape under pressure while only a dribbling stream escaped at the meatus. The patient was compelled to wear a perineal pad and to change it and his underclothes many times a day. Altogether his condition was pitiable, and had profoundly affected his health and spirits. For the relief of this condition he presented himself one year after the accident.

Examination showed the condition as described. The urine, however, was bright, clear, and contained only a very few shreds. After preparing the urethra, a filiform was with difficulty wormed through the tortuous stricture into the bladder. On this, tunnelled catheter No. 9 F. was threaded and passed to the bladder by gentle manipulation. Moderate hemorrhage was excited. Tunnelled sound No. 11 F. completed the first dilatation. The unyielding nature of the stricture and the patient's worn-out, hyperæsthetic condition, made strict conservatism desirable. All instrumentation, however gentle, caused considerable suffering. Local anæsthesia could not be taken advantage of, as the anæsthetizing solution escaped through the sinus as fast as it was injected at the meatus. After a final irrigation of the urethra the patient was sent home to rest as much as possible and to take a hot sitz-bath three times daily. A urinary antiseptic was prescribed.

Four days later (his second visit) he reported that he had suffered no reaction, and that the stream from the meatus was stronger The dilatation at this sitting was effected by the filiform guide and tunnelled instruments Nos. 9, 12, 14, and 16 F. Barely more than a tinge of blood followed. The usual irrigation of the urethra, before and after,

was performed. That evening retention of urine occurred. Apparently it was due, in part, to urethral spasm; it was easily relieved with a soft rubber catheter by his physician. Decided improvement was now noticed. He could void urine without effort; there was less leakage from the sinus; one perineal pad a day was sufficient.

Five days later (his third visit), a preliminary stretching was given the entrance of the strictured zone with the conical tip of a 23 F. flexible bougie. The dilatation was completed with filiform and tunnelled sounds beginning with 14 F. and ending with 20 F. For the first time there was more than moderate hemorrhage. Therefore, when irrigating the penile urethra, about two ounces of the fluid were made to flow into the bladder from the meatus, after which the patient stood up and voided the fluid.

On the fifteenth day the sinus closed. To favor it, and because of the hemorrhage excited by the third dilatation, no increase of the caliber was attempted until the sixth dilatation, sixteen days later, when 22 F. was reached. Though vey carefully passed, it caused an immediate reopening of the sinus.

For the next four months it was alternately open and closed. Every passage of plain steel sounds at intervals of one week while raising the caliber of the stricture from 22 F. to 25 F. caused the sinus to leak a little for a few days. After a most cautious and gradual dilatation to 27 F. with a Kollmann dilator, the sinus leaked a great deal.

The indications were plain for more conservative dilatation of the stricture, and coincident stimulation of the urethral mucous membrane with silver nitrate solutions. Accordingly the patient was taught to pass sound 24 F. and later 25 F. once a week, after which the topical treatment of the urethra was

carried out with endoscope, syringe-sound, or catheter.

Meanwhile the involuntary, continuous leaking from the sinus had gradually ceased; urine escaped from it now only during urination. When he had become expert with sound 25 F., he was directed to pass it every five days and to come for topical treatment and further dilatation every two weeks. On two of these occasions the Kollmann dilator was used, but never opened beyond 28 F. Later he was given sound 27 F. to pass once a week. The sinus now allowed only a drop to escape during urination, and in the course of the twenty-first week it closed permanently. Long before this he had recovered his health and had resumed business.

A few months later he was passing 28 F. easily once a week and reporting at the office every four weeks. His urination was normal. The urine contained only a few flakes with slight excess of mucus. After he had been passing 28 F. only once every ten days for awhile, he ceased reporting monthly as usual, apparently well satisfied with his condition.

The comment may be added that topical treatment every two weeks should have been continued awhile longer in such a case; but the patient found it inconvenient to come to the city regularly.

Case V is one of recontraction following a neglected urethrotomy.

B., age forty, married. He was referred to me on June 22, 1901, complaining of an inability to urinate except in drops. This condition had existed a month. He had had urethritis only twice, the latest fifteen years before. With both, severe chordee. In 1884 he was thrown astride the limb of a tree, but neither hemorrhage nor dysuria followed. Five years later he had acute retention for which a perineal section and urethrotomy were performed. There was no after-treatment and he failed to pass

the sound with which he had been provided. Twice since then he had had retention, to relieve which he had catheterized himself with an English web, stiletted catheter of small caliber. He declared he passed it without producing any hemorrhage. His alcoholic habit was fairly marked.

Examination showed a filiform stricture situated toward the upper limit of the bulbous portion. By the usual technique a filiform was passed to the bladder. The smallest tunneled catheter was arrested. First proving that the instrument was obstructed and not held by the swelling of the filiform within the necessarily narrow tunnel, a Bank's bougie was substituted and the stricture dilated a very little. After the urethra had been irrigated again he was sent home to take a hot sitz-bath at once, to go back to bed and to use hot applications locally. By the following day a slight recontraction had taken place. He was still able to urinate a stream, however. A copious urethral irrigation, as warm as he could bear, was given, and he was instructed to use a hand-injection twice daily of a hot solution of boric acid. The third day a second attempt to dilate the stricture was made. The lumen was not found as easily as on the first occasion, and the somewhat prolonged instrumentation caused increased swelling in the stricture. As a consequence, the following afternoon, he developed retention which had to be relieved by passing Banks' bougie and leaving it in place for five minutes. Immediately thereafter he voided urine in a good stream. The urethra was irrigated before and after, as usual.

It having become evident that serious retention might occur before dilatation could succeed, the patient was sent into the hospital at once for operation. It was to be expected that preparatory rest in bed and systematic irrigation of the penile

urethra for three days would relieve the congestion about the stricture and allow the tunneled catheter to pass. Owing to a misunderstanding the irrigations were not carried out, and the stricture remained impassable to the metal instrument at the time of operation. I therefore cut down through the bulb upon the tip of the instrument at the face of the stricture. With a slender probe-pointed knife, the lumen was enlarged until it would admit a thin, grooved director along the filiform guide. The urethrotomy was then completed to 30 F., with bistoury and Otis urethrotome.

Twenty-four hours later the urethra was irrigated and sound 28 F. was passed until it encountered the perineal tube. The bladder was irrigated daily. On the third day the perineal tube was removed permanently; the bladder being healthy did not demand longer drainage. At the same time a 30 F sound was passed through the whole length of the urethra. This was repeated five days later. The perineal wound had closed by the seventh day. The patient left the hospital on the thirteenth day and reported at the office.

As is not unusual early in the after-treatment, a slight degree of narrowing was noted at this time. Furthermore, the configuration was such that the point of the sound had to be deflected before it would pass smoothly onward to the bladder. From this date the management consisted of the usual gradual dilatation at weekly intervals to restore the caliber, and of instillations of silver nitrate by means of the Bangs' syringe-sound, alternating with applications through the endoscope, occasionally combined with a silver nitrate irrigation of the bladder. At the end of two weeks, the caliber was again 30 F.; the incisions in the urethra had healed, as shown by the absence of blood after instrumentation; the occasional slight incontinence of which he had com-

plained after leaving the hospital had ceased, and the urine presented only a few flakes. Having known before how to pass a sound for himself, he was easily re-instructed. On September 10 he was obliged to leave the city. His instructions were to pass his sound once every two weeks.

He reappeared December 5 in bad condition, physically and mentally, the result of hard drinking and neglect to pass his sound for about two months. Nevertheless, the urinary function was normal and the urine contained only a very few light shreds. Examination showed a recontraction to 24 F.; but after sound 24 F. had been passed, 26 F. followed with fair ease. This instrumentation, however, was sufficient to re-awaken enough posterior urethritis and urethrocystitis to give him cloudy urine again. Two bladder irrigations with 1-1000 solution of silver nitrate four days apart were corrective. Within two weeks he was again passing a full-size sound at proper intervals; but he continued drinking and soon disappeared from observation.

CASE VI is typical of stricture of large caliber with secondary posterior urethritis and urethrocystitis due to a combination of causes: An antecedent urethritis, the stricture itself, excessive use of tobacco and coffee, lithuria, and the practice of withdrawal in which the patient had indulged three times a week ever since marriage three years before.

F., age twenty-six, married, came to the office complaining of very frequent and painful urination. He was compelled to rise at night every half hour. Shortly after marriage he developed a mild urethritis, anterior and posterior. Since then there had been a sense of uneasiness during urination. With this exception he had enjoyed average general health until two months before, when he began to urinate with gradually increasing frequency. At one time urination occurred every fifteen minutes accom-

panied by pain referred to the vesical neck. Any jolting increased the bladder pain. A month later blood appeared in the urine; but under rest in bed and irrigation of the bladder this ceased in about a week. From time to time he had gone to bed, and had been variously treated for cystitis, vesical calculus, and prostatitis. He had resorted to morphine suppositories. There was neither a personal nor a family history of tuberculosis. By nature neurotic he had now become neurasthenic. He was an abstainer from alcohol, but an inveterate smoker; his habit as to coffee was two cups three times a day.

On examination he strained to produce a stream, and then suffered severe tenesmus. The urine was opaque with phosphates and pus. The symptom-complex was so suggestive of vesical calculus that I persuaded him to let me search his bladder.

After excluding acute prostatitis, the penile urethra was irrigated, anæsthetized, and moderately distended with iodoform oil. A small soft rubber catheter was very slowly passed to the bladder. Even the gentlest irrigation was painful; the bladder could tolerate only two and one-half ounces. Nevertheless, with a Thompson searcher as thorough an examination as possible was made. No calculus was detected.

He was put to bed and on fluid diet, chiefly milk, the free use of plain water, and urinary antiseptics. Very gentle irrigation of the bladder from the meatus once daily with a warm solution of boric acid was carried out, the penile urethra previously anæsthetized. He began to improve at once and dispensed with his morphine suppositories. By the fourth day he was rising only every two hours at night, and could retain four ounces of urine at a time during the day. The quality of the urine had greatly improved.

Under local anæsthesia an instillation was now attemptcd with a 20 F. soft rubber catheter. It was obstructed at the bulbomembranous junction. Prolonged instrumentation being contraindicated, a bladder-irrigation from the meatus was given instead. Thc following day a *smaller* catheter was introduced easily, and a one per cent. solution of protargol instilled.

Three days later, the bladder tolerating seven ounces, cystoscopy under local anæsthesia was performed. The mucous membrane in general was fairly normal; the trigonc was congested. No calculus was secn. As a final proof, a 22 F. evacuating tube was introduced and the bladder carefully pumpcd. The stricture at the bulbomembranous junction was then gently dilated to 26 F., after which the bladder and the urcthra were flushed by catheter and a 1-per-cent. protargol solution.

No reaction followed the instrumentation; he was allowed up the following day. His diurnal urinary intervals were now from two to three hours; probably they would have been longer but for the prescribed diluent. At night he had to urinate but once. Four days later (on the twelfth day) he left the nouse and reported at the office. The urine now showed many shreds in the first glass, but only an excess of mucus in the second. Endoscopic examination of the membranous urethra showed acute hyperæmia; at the bulbomembranous junction the mucous membrane had a swollen, thickened appearance and bled slightly; the bulb presented congestion. Silver nitrate solution, five grains to the ounce, was applied.

At the end of another week he did not have to rise at all at night. The urine showed a few shreds in the first glass, the second was clear. A com-

bined dilatation and instillation of a 1–1000 solution of silver nitrate by means of a 26 F. Bangs' syringe-sound was given. It was repeated at weekly intervals twice, and again at the end of two weeks. Three weeks after this he was entirely free from the long-standing urethral irritability. He was asked to report every two months for inspection.

Case VII is one of chronic extravasation of urine with scrotal abscess and urinary fistula. Incidentally it illustrates the reparative power of the urethra.

C., fifty-nine, married, was admitted to my service at the Post-Graduate Hospital June 30, 1903, complaining of long-standing dysuria and of a scrotal abscess that had developed about four months before. It had twice been incised and more or less completely drained. His health had failed; finally he had to give up work.

Examination showed extreme hyperæsthesia, a filiform stricture in the midzone of the penile portion, and a foul, sloughing sinus in the right half of the scrotum, which in turn was much inflamed and tumefied. Near the root of the penis the abscess had a small upper opening, from which a few drops of urine escaped during urination, while from the large lower opening it came in a free stream. The patient was poorly nourished and in bad general condition. He was slightly septic and uræmic.

After two days of rest in bed and preparation, an ordinary external urethrotomy was performed by the usual technique. The stricture was divided to 30 F. with the Otis urethrotome. A length of soft rubber catheter was tied in the penile urethra to act as a splint, that the opening between the urethra and the sinus might be allowed to close properly by granulaton. The scrotal sinus was treated by dissecting away all the old cicatricial tissue from

the lower opening after both it and the upper opening had been enlarged, and by thorough curetting. Through and through drainage was established.

On the fifth day the catheter-splint was removed from the urethra and very gentle irrigation from the meatus was performed once daily. No fluid escaped by way of the sinus; the communication proved to have closed permanently. The bladder was irrigated once daily by way of the perineal tube, which was removed, sterilized and reinserted at proper intervals up to the tenth day, when it was left out. The perineal wound healed slowly; by the end of the fourth week it had closed permanently.

For obvious reasons a sound of small caliber, 22 F., was the first one used after the operation. This was on the tenth day. It passed smoothly and was repeated a few days later. On the seventeenth day it was repeated and the bladder irrigated with two ounces of a 1–1000 silver nitrate solution, the urine not being satisfactory. Following this the bladder was irrigated with boric solution once daily, but owing to a misunderstanding of the order was distended to its capacity.

The patient now developed an irregular temperature, ranging from 99° F. to 104° F., apparently due to the lighting up of an old pyelitis or an absorption focus in one or the other kidney. All local treatment was therefore discontinued. Under free diuresis (up to six quarts of water a day), the administration of stimulants, urinary antiseptics, and creosote, the fever ran its course in about three weeks.

Two weeks later the after-treatment of the urethra and bladder was resumed. He has progressively improved in health and strength, and has returned to his business. At present, sound 23 F. can be

passed with ease; the bladder function is good and the urine is fairly clear. The scrotal sinus has remained closed, as has also the perineal wound.

A summary follows of certain details in the technique: Copious irrigation of the penile urethra from the meatus with a solution as warm as the patient can bear, is advised before and after instrumentation until the stricture has been dilated beyond the danger of retention from reactionary swelling. The irrigating solution should be delivered under gentle pressure from a hand-syringe with separate blunt tip. Similar irrigation, or an instillation or irrigation of silver nitrate, protargol or argyrol, is to be practised whenever blood appears after instrumentation.

To facilitate the passage of small instruments, especially filiform bougies, and for asepsis, the penile urethra is moderately distended with a 5-per-cent. solution of iodoform in sterile sweet almond oil or with plain sterile oil.

The filiform guide and tunnelled instruments are dispensed with as soon as a 20 F. ordinary sound can be passed to the bladder with fair ease. Exceptionally the filiform guide may be dispensed with at 18 F.; but, if the canal through the stricture is tortuous, or if there is a pocket or an old false passage, a sound of small caliber than 20 F., unless very blunt, is dangerous except in skilled hands.

The bladder is treated so long as there is evidence of cystitis or urethrocystitis.

Specific treatment of the urethral mucous membrane with silver nitrate solutions is begun as soon as a caliber of 18 or 20 F. has been reached, and is continued combined with dilatation, until the tissues have been made as near normal as possible under the conditions present.

At the conclusion of the after-treatment following urethrotomy, the patient should report at fixed intervals for two years that any tendency to recontraction may be detected and met, and that, if he is required to pass a sound, the proper limitations thereto may be prescribed.

20 East Forty-Sixth Street.